

Amendment to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the subject application:

1. (Currently amended) A method for preparation of an anode for a solid oxide fuel cell comprising the steps of:

mixing a porous matrix material with a yttria-stabilized-zirconia (YSZ) powder, forming a porous matrix material/powder mixture;

forming said porous matrix material/powder mixture into a porous YSZ layer;

calcining said porous YSZ layer; and

impregnating said porous YSZ layer with a ~~Cu-containing metal-~~
containing salt solution comprising an electron-conducting metal having an oxide form which melts at a temperature less than about 1550°C.

2. (Original) A method in accordance with Claim 1, wherein said porous matrix material comprises a plurality of zircon fibers.

3. (Previously presented) A method in accordance with Claim 1, wherein said porous matrix material/powder mixture is mixed with glycerol and

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applied to an anode side of a YSZ electrolyte, forming said porous YSZ layer on said anode side of YSZ electrolyte.

4. (Previously presented) A method in accordance with Claim 1, wherein said porous matrix material/powder mixture is added to a tapecast and said tapecast is deposited onto an anode side of a YSZ electrolyte layer, forming said porous YSZ layer on said anode side of YSZ electrolyte.

5. (Previously presented) A method in accordance with Claim 4, wherein a cathode is applied to a cathode side of said YSZ electrolyte layer after said calcining of said porous YSZ layer.

6. (Previously presented) A method in accordance with Claim 1, wherein a metal content of said porous YSZ layer is at least about 35% by weight of said porous YSZ layer.

7. (Previously presented) A method in accordance with Claim 1, wherein said impregnated porous YSZ layer is calcined.

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8. (Previously presented) A method in accordance with Claim 1, wherein said porous YSZ layer is impregnated with ceria.

9. (Previously presented) A method in accordance with Claim 8, wherein said ceria constitutes in a range of about 5% to about 40% by weight of said porous YSZ layer.

10. (Currently amended) A method for producing a solid oxide fuel cell comprising the steps of:

mixing a porous matrix material with a yttria-stabilized-zirconia (YSZ) powder, forming a porous matrix material/powder mixture;

mixing said porous matrix material/powder mixture with glycerol, forming a slurry;

applying said slurry to an anode-facing face of a dense YSZ electrolyte layer, forming a porous anode layer/electrolyte layer assembly;

calcining said porous anode layer/electrolyte layer assembly;

applying a cathode layer to a cathode-facing face of said electrolyte layer, forming a fuel cell assembly;

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impregnating said porous anode layer with a ~~Cu-containing~~ metal-containing salt solution comprising an electron-conducting metal having an oxide form which melts at a temperature less than about 1550°C; and

calcining said impregnated porous anode layer.

11. (Currently amended) A method in accordance with Claim ~~12~~ 10, wherein a metal content of said calcined impregnated porous anode layer is at least about 35% by weight of said calcined impregnated porous anode layer.

12. (Previously presented) A method in accordance with Claim 10, wherein said porous matrix material comprises a plurality of zircon fibers.

13. (Previously presented) In a solid oxide fuel cell comprising an anode electrode, a cathode electrode and an electrolyte disposed between said anode electrode and said cathode electrode, the improvement comprising:

said anode electrode comprising a porous YSZ layer and one of a Cu metal and a Cu alloy.

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14. (Previously presented) A solid oxide fuel cell in accordance with Claim 13, wherein said anode electrode further comprises ceria.

15. (Previously presented) A solid oxide fuel cell in accordance with Claim 13, wherein a metal content of said anode electrode is at least about 35% by weight of said porous YSZ layer.

16. (Previously presented) A solid oxide fuel cell in accordance with Claim 14, wherein a ceria content of said anode electrode is in a range of about 5% to 40% by weight of said porous YSZ layer.

17. (Currently amended) A method for generating electricity comprising the steps of:

introducing at least one of a hydrocarbon and a carbonaceous fuel directly into an anode side of a solid oxide fuel cell comprising an anode electrode comprising a porous YSZ layer and ~~one of a Cu metal and a Cu alloy~~ an electron-conducting metal having an oxide form which melts at a temperature less than about 1550°C, a cathode electrode and an electrolyte disposed between said anode electrode and said cathode electrode;

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introducing an oxidant into a cathode side of said solid oxide fuel cell;
and

directly oxidizing said at least one of said hydrocarbon and said carbonaceous fuel in said solid oxide fuel cell, resulting in generation of electricity.

18. (Previously presented) A method in accordance with Claim 17, wherein said hydrocarbon comprises at least two carbon atoms.

19. (Previously presented) A method in accordance with Claim 17, wherein said anode electrode further comprises ceria.

20. (Previously presented) A method in accordance with Claim 17, wherein said carbonaceous fuel is an alcohol.